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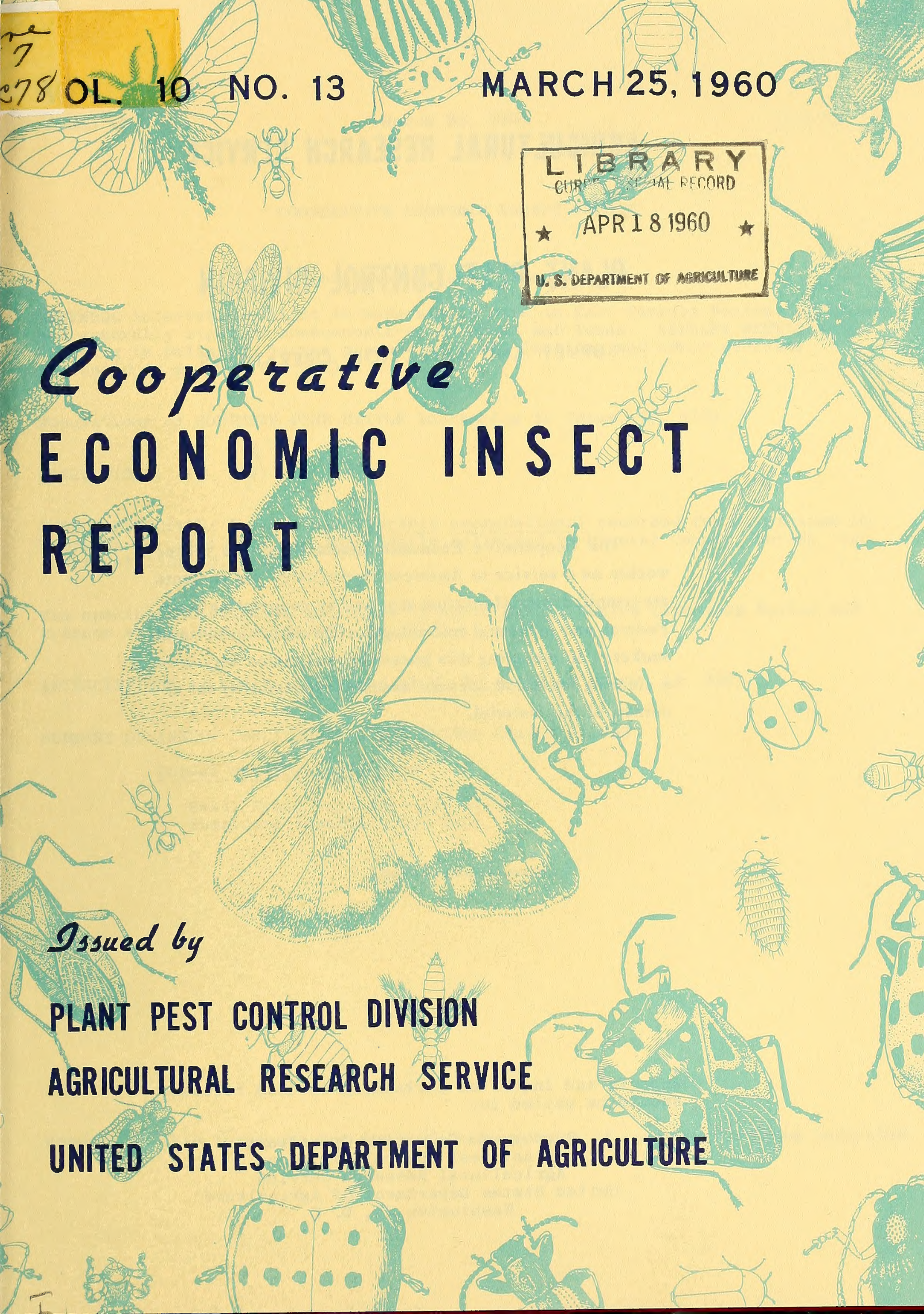

Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
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Volume 10 March 25, 1960 Number 13

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

GREENBUG infestations light to moderate in oats in East Carroll Parish, Louisiana, and generally light or noneconomic in Oklahoma and Texas. ALFALFA WEEVIL eggs hatching in Delaware, larvae present in South Carolina and adult activity increased in Nevada. (p. 211).

Populations of SOUTHERN PINE BEETLE increasing in Texas. (p. 213).

CORRECTIONS. (p. 21~~7~~6).

INSECT DETECTION: A tortricid (*Tortrix cockerellana*) recorded for first time in Nebraska (p. 213), and elm leaf beetle collected in Mineral County, Nevada, for the first time (p. 214).

The species and relative abundance of North Dakota APHIDS infesting barley and grasses with a key to species. (p. 217).

INTERCEPTIONS of special interest at U. S. ports of entry. (p. 220).

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1959

Cereal and Forage Insects

Small Grain Insects - (p. 221).
Sugarcane Insects - (p. 230).

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Reports in this issue are for the week ending March 18, unless otherwise indicated.

WEATHER BUREAU 30-DAY OUTLOOK

MID-MARCH TO MID-APRIL 1960

The Weather Bureau's 30-day outlook for mid-March to mid-April calls for temperatures to average below seasonal normals over most of the Nation except for near normal along the northern tier, the west coast states, and the extreme Southeast. Greatest departures are predicted for the Central and Southern Plains as well as the Ohio Valley. However, a reaction to springlike weather is expected during the first half of April, especially over much of the east. Precipitation is expected to exceed normal over the southern two-thirds of the country lying east of the Continental Divide, with additional snows in north central areas. Subnormal amounts are predicted west of the Continental Divide and along the Northern border. In unspecified areas, near normal amounts are indicated.

Weather forecast given here is based on the official 30-day "Resume and Outlook", published twice a month by the Weather Bureau. You can subscribe through Superintendent of Documents, Washington 25, D. C. Price $4.80 a year, $2.40 a half year.

WEATHER OF THE WEEK ENDING MARCH 21

Persistent very cold weather in the Great Plains, the Mississippi and Ohio Valleys, the lower Great Lakes region, and the Middle and South Atlantic States continued to be the dominant weather feature this week. Conditions typical of midwinter prevailed over this large region. Temperatures averaged 10° or more below the seasonal normals for the fifth or sixth consecutive week in most areas from northeastern Texas and southern Georgia northward to the eastern Dakotas, southern Wisconsin and western Pennsylvania and Maryland; and moderate to heavy snow, sleet and freezing rain again covered large areas of the Nation's midsection and the Northeast. Freezing temperatures extended from southern Arizona and Texas along the Gulf coast to north-central Florida, while below-zero readings covered the northern Great Plains and upper Mississippi Valley and scattered areas of the Appalachians on one or more mornings.

Two low-pressure areas developed over Oklahoma and off the Georgia coast early in the week and moved northeastward, leaving locally heavy new snow from eastern Colorado and Oklahoma to the Great Lakes, and snow, sleet and rain from northern Georgia to New England. Snowfall ranged from 5 to 11 inches in Virginia, up to 7 inches in northern Maine, 6 inches in the Catskills in New York, 5 inches in northeastern Ohio, 2 to 9 inches in Iowa, Illinois and Wisconsin, and 10 to 15 inches in northeastern Kansas, southeastern Nebraska and northwestern Missouri. Snowfall at Richmond, Virginia, in March, has now surpassed the previous alltime record, and at Roanoke, Virginia, and Rochester, New York, the seasonal record has been topped. Extremely heavy rainfall and several tornadoes developed along a stationary front in central Florida from Tuesday through Friday. Most areas from the Suwanee River southward to Tampa and Vero Beach received from 5 to 10 inches of moisture, and unofficial reports indicate more than 20 inches in portions of Pasco County, north of Tampa. Precipitation in other areas east of the Rocky Mountains was generally light to moderate. Totals of 1/2 to 1 inch extended from portions of the central Great Plains to the lower Lake Michigan area and covered portions of the Southeastern and Middle Atlantic States.

In the Western States, temperatures moderated rapidly during the week and averaged much above normal in most of California and in central Montana. On the 20th, the 72° reading at Great Falls, Montana, equalled the highest for March there, and the 89° mark at Fresno, California, was a new high for so early in the year there, as was the 74° at Pendleton, Oregon, on the 21st. Precipitation early in the week in the West was generally light to moderate, with 1 to over 2 inches of rain in coastal Oregon and Washington and lighter amounts inland and southward. Light to locally heavy snow fell in northern Nevada and Utah, western Wyoming and Colorado, and northern New Mexico. Mostly clear and dry weather was the rule later in the week. At the end of the period, extremely cold arctic air was moving southward from the Great Plains eastward. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GREENBUG (Toxoptera graminum) - LOUISIANA - Infestations ranged light to moderate in 4 fields of oats in East Carroll Parish and in 4 fields in Tensas Parish. Weather remains very cold and wet and oats are showing little growth. (Spink). OKLAHOMA - Populations decreased only 20 percent during past month of inclement weather in a wheat field checked near Perkins, Payne County. Counts taken in the field on February 18 averaged 150 per linear foot while those taken on March 18 averaged 124 per linear foot. (Wood). Greenbugs, mixed with other aphids, found in approximately one-third of the fields of small grain checked in Kingfisher, Blaine, Dewey, Custer, Caddo, Canadian, Washita, Comanche, Stephens, Grady and Cleveland Counties. Populations remained light in all infested fields checked, with counts averaging 15 per linear foot in a wheat field near Watonga, Blaine County. Counts in most infested fields in the area averaged less than one per linear foot. (VanCleave, Vinson). Populations showed some decrease compared with previous weeks in a wheat field checked in Hennessey area, Kingfisher County. Counts now average 4 per linear foot. (Owens). None noted in 2 wheat fields checked in Washita and Beckham Counties (Hudson); and counts averaged 8 per linear foot in an oat field checked near Kingston, Marshall County (Vinson). TEXAS - None were found in fields checked in Roberts, Lipscomb, Wheeler and Ochiltree Counties and very limited infestations were noted in Potter and Carson Counties. Three fields checked in Wilbarger County were negative. (Daniels). Infestations ranged from none to very light in Bailey, Parmer, Deaf Smith, Castro and Swisher Counties. (Hawkins).

CORN LEAF APHID (Rhopalosiphum maidis) - CALIFORNIA - Medium infestation on barley in vicinity of El Centro, Imperial County. Nymphs and adults present. (Peterson, Ext. Ser.). OKLAHOMA - Light populations, less than 5 per linear foot, noted in about one-fourth of the fields of small grain checked in central and west central areas. (VanCleave, Vinson). Light, 2 per linear foot, in field of oats checked near Kingston, Marshall County. (Vinson).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Counts averaged 1,000 plus per linear foot in one barley field in the Loyal area near the Blaine-Kingfisher County line. Effects of feeding were quite evident throughout the field. R. maidis was also present, but in considerably less numbers. Light populations of R. fitchii found in approximately one-third of the fields of small grain checked in central and west central areas. Heaviest counts averaged less than 5 per linear foot, with most counts averaging less than one per linear foot. (VanCleave,Vinson).

A WHEAT APHID (Brachycolus tritici) - TEXAS - Infestations reported found in large clumps of wheat in Potter and Carson Counties. This species affects wheat by stunting heads and causing leaves to turn yellow. (Daniels).

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - Present in limited numbers, less than 25 per linear foot, in approximately one-fifth of the fields of small grain checked in the central and west central areas. (VanCleave, Vinson).

CUTWORMS - OKLAHOMA - Counts of unspecified species averaged 3 per linear foot in a wheat field checked in Hennessey area, Kingfisher County. (Owens). Light populations, less than 0.5 per linear foot, noted in scattered fields of small grain throughout the central and west central areas. (VanCleave, Vinson).

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) - OKLAHOMA - Counts averaged 4 live larvae per 25 stalks in a field of corn stubble checked in Marshall County. (Vinson).

ALFALFA WEEVIL (Hypera postica) - SOUTH CAROLINA - Larvae are present in alfalfa fields. (Nettles et al.). DELAWARE - Overwintering eggs found from light in one field to heavy in another field in New Castle County. Stalks examined for eggs revealed many eggs just hatched or on the verge of hatching. One cluster of new spring eggs found on March 1. (Burbutis, Mason). NEVADA - Adult activity has increased due to warm temperatures and most spraying has been completed in the western counties. (Coop. Rpt.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - OKLAHOMA - Light, averaged 5 per square foot of crown area, in an alfalfa field near Bison, Garfield County. (Owens). Light, averaged 3 per square foot, in an alfalfa field surveyed in Marshall County. (Vinson). TEXAS - Light, widespread infestations attacking alfalfa in El Paso County; counts averaged 5 per sweep. (Hawkins). NEVADA - Counts averaged 1 per 3 sweeps at Las Vegas, Clark County. (Bechtel, Lauderdale).

PEA APHID (Macrosiphum pisi) - CALIFORNIA - Heavy infestation on alfalfa in El Centro area, Imperial County. Nymphs and adults present. (Peterson, Ext. Ser.). NEVADA - Counts averaged 5 per sweep in alfalfa in Las Vegas, Clark County. (Bechtel, Lauderdale). NEW MEXICO - Beginning to build up in a few fields checked in southern Dona Ana County. (N. M. Coop. Rpt.). OKLAHOMA - Light, averaged 3 per square foot of crown area, in an alfalfa field surveyed in the Bison area, Garfield County. (Owens). Light, averaged 2 per square foot, in an alfalfa field in the Lebanon area, Marshall County. (Vinson).

COWPEA APHID (Aphis medicaginis) - NEVADA - Counts averaged 8 per stem in alfalfa in Las Vegas, Clark County. (Bechtel, Lauderdale).

FRUIT INSECTS

GREEN PEACH APHID (Myzus persicae) - COLORADO - An egg survey was conducted in Mesa, Delta and Montrose Counties from February 16 to March 14. The mean number of eggs per 100 fruit buds by areas is tabulated below. (Colo. Ins. Sur.).

Area	1960	1959
Redlands, Mesa County	0	3
Appleton, "	3.0	14.0
Palisade, "	1.14	3.0
Vineland, "	1.0	108.0
Orchard Mesa, "	.14	12.6
Clifton, "	.33	.50
Paonia, Delta County	3.85	45.50
Austin, "	23.00	0
Olathe, Montrose County	5.85	*

* No survey in 1959

CALIFORNIA TENT CATERPILLAR (Malacosoma californicum) - CALIFORNIA - First to third-instar larvae present in moderately heavy populations and locally damaging neglected almond orchards in Concord area of Contra Costa County. (Cal. Coop. Rpt.).

APPLE MEALYBUG (Phenacoccus aceris) - OREGON - Nymphs appearing on filbert trees in the Gervais area by March 16. Infestations appear materially reduced from those of previous years. (Jones).

TRUCK CROP INSECTS

CABBAGE LOOPER (Trichoplusia ni) - TEXAS - Some increases in activity in late cabbage reported in lower Rio Grande Valley, but populations remain at a fairly low level. (Deer).

CABBAGE APHID (Brevicoryne brassicae) - GEORGIA - Light infestations on cabbage in Colquitt County. (Johnson).

THRIPS - NEW MEXICO - Moderate to heavy infestations in most onion fields checked in Dona Ana County. Many fields averaged from 15-30 thrips per plant. (N. M. Coop. Rpt.).

SEED-CORN MAGGOT (Hylemya cilicrura) - CALIFORNIA - A local heavy infestation reported from garbanzo beans in Chico, Butte County. (Cal. Coop. Rpt.).

SPIDER MITES (Tetranychus spp.) - LOUISIANA - Heavily infesting strawberry plants in Tangipahoa Parish. Heavy egg deposition was also noted. Severe damage can be expected when the weather warms sufficiently for the mites to become active. (Spink).

TOBACCO INSECTS

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - GEORGIA - Light infestations on tobacco in the plant bed in Ben Hill, Cook, Lowndes, Brooks and Colquitt Counties. (Johnson).

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - GEORGIA - Light to moderate infestations on tobacco in the plant bed in Ben Hill, Cook, Lowndes, Brooks and Colquitt Counties. (Johnson).

SNAILS - SOUTH CAROLINA - Some damage reported in tobacco plant beds in Clarendon County. (Nettles et al.).

COTTON INSECTS

CUTWORMS - TEXAS - Unspecified species moving into some cotton fields from adjacent fields in Hidalgo County. (Deer).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

A TORTRICID (Tortrix cockerellana) - NEBRASKA - Larvae completely webbed and defoliated a few red cedar trees at North Platte, Lincoln County, during August and September of 1958. Itoplectis conquisitor and an unidentified dipterous insect heavily parasitized the larvae. Light trap collections in 1959 showed the presence of a few moths, but no infestations were observed. Moths recently determined by J. F. G. Clarke. (Pruess). According to ARS and U. S. National Museum records, this is the first report of T. cockerellana in Nebraska.

SOUTHERN PINE BEETLE (Dendroctonus frontalis) - TEXAS - Populations are still increasing. Due to wet ground, very little control work or ground checking was done. On an aerial detection flight, ten newly infested spots, as well as additional single infested trees, were located. There are 43 spots lacking control of which 5 have in excess of 100 trees. Up to 600 per square foot of healthy larvae, preparing to pupate, have been found in sample trees. (Young).

PINE NEEDLE SCALE (Phenacaspis pinifoliae) - DELAWARE - Heavy infestation on Virginia pine in north Wilmington and on spruce trees in Newark, New Castle County. (Burbutis, Mason).

A SCALE INSECT (Ehrhornia cupressi) - CALIFORNIA - Heavy infestation recorded on Arizona cypress in Lancaster, Los Angeles County. (Cal. Coop. Rpt.).

SPRUCE SPIDER MITE (Oligonychus ununguis) - MARYLAND - Eggs abundant on Norway spruce at College Park, Prince Georges County. (U. Md., Ent. Dept.).

A PINE PITCH MIDGE (*Retinodiplosis inopis*) - SOUTH CAROLINA - Reported in Spartanburg on loblolly pines. Det. by Dr. Fox. (Nettles et al.).

ELM LEAF BEETLE (*Galerucella xanthomelaena*) - NEVADA - Overwintering adults collected at Hawthorne, Mineral County. This is the first record for Mineral County and the most southern record of the species in the State. (Bechtel, Kuntze).

DOGWOOD BORER (*Thamnospecia scitula*) - OREGON - A survey to determine the extent of infestation in Oregon nurseries has been completed. This insect, introduced on budded dogwood from several southeastern states, appears to be confined to the introduced trees. These trees have been destroyed or fumigated. (Capizzi).

SOUTHERN RED MITE (*Oligonychus ilicis*) - LOUISIANA - Large populations observed on azaleas in lath houses at Abita Springs. (Spink).

APHIDS - OKLAHOMA - Light to medium infestations of *Cinara* sp. continue to be common on arborvitae in the central and west central areas. (VanCleave, Vinson). NEW MEXICO - *C. tujafilina* is becoming abnormally abundant on arborvitae in southern counties. The species is also a nuisance in and around homes. Unspecified aphids are heavy on iris plants in Las Cruces area, Dona Ana County. (N. M. Coop. Rpt.). CALIFORNIA - Heavy infestation of *C. tujafilina* reported from property in Covina, Los Angeles County, on *Juniperus* sp. (Cal. Coop. Rpt.).

SCALE INSECTS - SOUTH CAROLINA - Noticeable on camellias in the Hampton area of Hampton County. (Nettles et al.). NEW MEXICO - An unspecified species found infesting willows planted around a home at Las Cruces, Dona Ana County. (N. M. Coop. Rpt.). CALIFORNIA - A heavy infestation of *Aspidiotus hederae* reported from Hanford, Kings County, on strawberry madrone (*Arbutus unedo*). (Cal. Coop. Rpt.).

GREENHOUSE PESTS - OKLAHOMA - Light infestations of aphids and spider mites continue to be reported on a variety of plants in some greenhouses in the east central and southwestern areas. (Stiles, Latham, Hatfield).

INSECTS AFFECTING MAN AND ANIMALS

CATTLE GRUBS (*Hypoderma* spp.) - TENNESSEE - Of 100 cows checked in Cumberland County, 26 percent were found infested. Infestations were 10 percent *H. bovis* and 90 percent *H. lineatum*. Of 34 cows checked in Anderson County, 35 percent were infested. Infestations were 90 percent *H. bovis* and 10 percent *H. lineatum*. Counts were made the first week of March. (Stanley). NEBRASKA - Counts on February 9 in Lancaster County showed that 23 coming yearling calves averaged 5.4 grubs per animal; however, one-half of the animals were not infested. Three control groups, totaling 61 animals, in Cherry County, averaged 5.4 grubs per animal on February 9. Sixty-one mixed heifers and steers in Sioux County averaged 1.5 grubs per animal on February 16 and 17. (Jones,Roselle, Andersen). OKLAHOMA - A total of 3 *H. lineatum* grubs found on 70 head of untreated yearling heifers checked at Fort Reno, Canadian County, on March 15. (Kinzer).

BLOODSUCKING CONENOSE (*Triatoma sanguisuga*) - TEXAS - Light, widespread infestation of adult females reported attacking humans in Cameron County. (Kachtik).

CATTLE LICE - OKLAHOMA - Heavy on approximately 70 percent of the cattle (75 head) checked in a sales barn in Pushmataha County. (Goin).

HOG LOUSE (*Haematopinus suis*) - OKLAHOMA - Heavy on 65 head of hogs checked at a sales barn in Pushmataha County. (Goin).

DOG FOLLICLE MITE (Demodex canis) - NORTH CAROLINA - Four cases reported to the State Veterinarian in February (Zweigart).

TICKS (unidentified) - OKLAHOMA - Light, averaged 8 per animal, on 30 percent of the cattle (75 head) checked in a sales barn in Pushmataha County. (Goin).

CAT FLEA (Ctenocephalides felis) - IDAHO - Infesting a Lewiston home (Kambitsch).

STORED-PRODUCT INSECTS

INDIAN-MEAL MOTH (Plodia interpunctella) - WISCONSIN - Extremely heavy populations found in bags of sunflower seeds in a Milwaukee seed-processing plant on February 23. (Wis. Coop. Sur.).

SAW-TOOTHED GRAIN BEETLE (Oryzaephilus surinamensis) - DELAWARE - Present in a feed mill in Sussex County. (Burbutis, Mason).

DEPRESSED FLOUR BEETLE (Palorus subdepressus) - DELAWARE - Present in a feed mill in Sussex County. (Burbutis, Mason).

BENEFICIAL INSECTS

PREDATORS - OKLAHOMA - Convergent lady beetle (Hippodamia convergens) and Nabis sp. were present in very limited numbers in fields of small grain checked in the central and west central areas. (VanCleave, Vinson).

MISCELLANEOUS INSECTS

EASTERN SUBTERRANEAN TERMITE (Reticulitermes flavipes) - NORTH CAROLINA - Infesting a large tourist home with slab construction. (Jones, Farrier). MARYLAND - Winged forms noted in houses at 3 localities in Prince Georges County. (U. Md., Ent.Dept.).

A TERMITE (Reticulitermes tibialis) - COLORADO - A swarm observed during the week ending March 17 when the temperature was 50° F. and relative humidity 60 percent in Larimer County. (Colo. Ins. Sur.).

LITTLE BLACK ANT (Monomorium minimum) - NORTH CAROLINA - Heavy, persistent infestation in a house in Forsyth County. (Wright).

BLACK CARPENTER ANT (Camponotus pennsylvanicus) - MARYLAND - Winged forms noted in a house at Silver Spring, Montgomery County, on March 16. (U. Md., Ent. Dept.).

IMPORTED FIRE ANT (Solenopsis saevissima richteri) - LOUISIANA - A heavy flight of kings and queens was observed at Port Barre in St. Landry Parish on March 16. (Spink).

ALMOND MOTH (Ephestia cautella) - WISCONSIN - Collected in a Milwaukee seed-processing plant on February 23 in seed bags and in the corrugations of boxes. (Wis. Coop. Rpt.).

GERMAN COCKROACH (Blattella germanica) - SOUTH CAROLINA - Extraordinary populations reported from Chester and Aiken Counties. (Nettles et al.).

BOXELDER BUG (Leptocoris trivittatus) - UTAH - A serious problem about some homes at Murray in Salt Lake County. (Knowlton).

SILVERFISH (Lepisma saccharina) - DELAWARE - Moderately heavy in a home in Newark, New Castle County. (Burbutis, Mason).

OLD-HOUSE BORER (Hylotrupes bajulus) - SOUTH CAROLINA - Larval infestation recorded in Spartanburg County. Det. by W. H. Anderson. (Nettles et al.).

A FRUIT FLY (Trupanea jonesi) - CALIFORNIA - Adult taken on flower of Monolopia major in Navajo Canyon, San Luis Obispo County; also found in sweeping wheat stubble in Cuyama, Santa Barbara County. (Cal. Coop. Rpt.).

CORRECTIONS

CEIR 10(7):90 - A WEEVIL (Rhysommatus sp.) should read (Rhyssomatus sp.).

CEIR 10(8):108 - Delete last sentence of first paragraph. Earwigs infesting homes in Georgia are NOT Forficula sp.

CEIR 10(10):151, 152 - Map on page 151 is upside down. The correct spelling of the specific name under the figures on page 152 is Zabrus tenebrioides.

LIGHT TRAP COLLECTIONS

	Pseudaletia unipuncta	Agrotis ipsilon	Feltia subterranea	Prodenia ornithog.	Heliothis zea
LOUISIANA					
Baton Rouge 3/11-17	6	2		2	1
Franklin 3/11-17			1	1	
SOUTH CAROLINA					
Charleston 3/14-20		1			

THE SPECIES AND RELATIVE ABUNDANCE OF NORTH DAKOTA APHIDS INFESTING BARLEY AND GRASSES WITH A KEY TO SPECIES [1]

Richard L. Post[2] George Senechal[3] and Robert E. Krause[4]

Barley yellow-dwarf, a virus disease transmitted by aphids, is a serious problem to the plant breeder because of its prevalence in late-planted spaced plots. At present, yellow-dwarf is of little concern to the commercial grower in North Dakota where it is confined to the borders of fields within 100 feet of the edges. Since little work had been done on North Dakota cereal-infesting aphids, major emphasis was directed towards determining the species and relative abundance of aphids infesting barley and grasses.

I. The Species and Relative Abundance of Aphids Infesting Barley and Grasses.

Relative abundance of the species of aphids infesting barley:- Plans were made to determine the numbers of plants infested and the relative abundance of the species of aphids per plant. Aphids were not abundant in North Dakota during 1959, and when examination of individual plants revealed less than 1 aphid per 150 plants, fields and grasses were swept so that several hundred plants could be sampled by 100 sweeps of a 12" net. A total of only 1,260 aphids were collected from 8 barley fields, representing three crop reporting districts of eastern North Dakota by weekly sweepings from June 1 to August 31. The relative percent abundance of the species were as follows:

Species	Percent
Macrosiphum granarium (Kby.), English grain aphid	47
Toxoptera graminum (Rond.), greenbug	39
Rhopalosiphum maidis (Fitch.), corn leaf aphid	8
Macrosiphum dirhodum (Wlk.), grass aphid	3.5
Rhopalosiphum fitchii (Sand.), apple grain aphid	2.5
Sipha agropyrella H.R.L.	Less than .02 of total populations

Relative abundance of aphid species infesting grasses:- Aphids were not common on grasses adjacent to the eight barley fields selected for aphid abundance studies. Based on 114 specimens, the relative percent abundance was as follows:

Species	Percent
Macrosiphum granarium (Kby.)	42
Toxoptera graminum (Rond.)	42
Rhopalosiphum fitchii (Sand.)	12.5
Rhopalosiphum maidis (Fitch.)	3.5
Macrosiphum dirhodum (Wlk.)	0

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[1] Work conducted under N. D. Exp. Sta., Project H-5-9, Insect Vectors of Barley Yellow-dwarf Virus, cooperative with Crops Research Branch, ARS, USDA, and the N. D. State Seed Dept.

[2] Associate Entomologist, N. D. Agricultural Exp. Sta. and N. D. State Seed Dept.

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[4] National Science Foundation Undergrad., Research Participant in Agricultural Entomology, NDAC.

CEIR, Volume 10(13):3-25-60.

Abundance of aphids in barley fields and on grasses bordering barley fields:- Aphids were more abundant along the borders of barley fields, 10-30 feet from the margins, than they were in the interiors, more than 40 feet from the edges or along the grassy borders of the fields. Aphids collected by 100 sweeps of an insect net averaged 26 along the border of barley fields; 8 in the interior of the fields; and 2 along the grassy borders of these barley fields.

II. Key for Determining Preserved or Mounted Adults and Fourth Instars of North Dakota Barley Aphids.

A. Cornicles with a definitely flanged (flared) tip; pale, becoming dark distally (Fig. 3). Unguis at least 5 times the length of the base (Fig. 6).................................... *Rhopalosiphum fitchii*

-- Cornicles without a definite flange (flare); if cornicles pale with dark tips the unguis is less than 5 times the length of base....... B

B. Cornicles dark throughout.. C

-- Cornicles pale with dark tips.. D

C. Cornicles more than 3 times the length of hind tarsus, dusky to black, reticulated distally (Fig. 1 & 9). Unguis more than 5 times the length of the base (Fig. 8).......................... *Macrosiphum granarium*

-- Cornicles less than 3 times the length of hind tarsus, dusky, not reticulated. Unguis less than 3 times the length of the base (Fig. 5).................................... *Rhopalosiphum maidis*

D. Antennae pale throughout. Cornicles pale with sometimes a dusky tip, more than twice the length of the hind tarsus. Unguis more than 4 times the length of the base (Fig. 7).......... *Macrosiphum dirhodum*

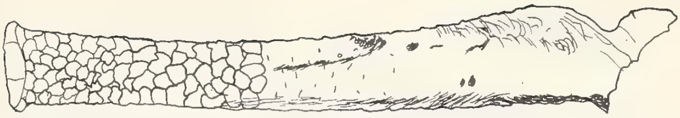
-- Antennae dark (dusky) beyond III (Alate usually has all dark antennae). Cornicles less than twice the length of the hind tarsus, pale with dark or black tips (Fig. 2). Unguis less than or equal to 4 times the length of the base (Fig. 4)......................... *Toxoptera graminum*

Definition of Terms

Base - The thickened part of last antennal segment, proximal of the unguis.
Cornicle - A tubular process on the posterior of the abdomen.
Reticulated - Weblike, resembling network; netted.
Unguis - That portion of the last antennal segment that forms the antennal apex, distal of the base.

Key to Figures on Page

1. Cornicle, *Macrosiphum granarium*
2. Cornicle, *Toxoptera graminum*
3. Cornicle, *Rhopalosiphum fitchii*
4. Unguis, *Toxoptera graminum*
5. Unguis, *Rhopalosiphum maidis*
6. Unguis, *Rhopalosiphum fitchii*
7. Unguis, *Macrosiphum dirhodum*
8. Unguis, *Macrosiphum granarium*
9. Hind tarsus, *Macrosiphum granarium*



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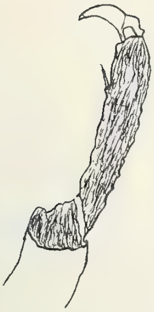

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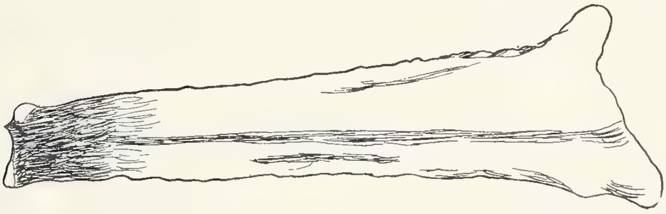

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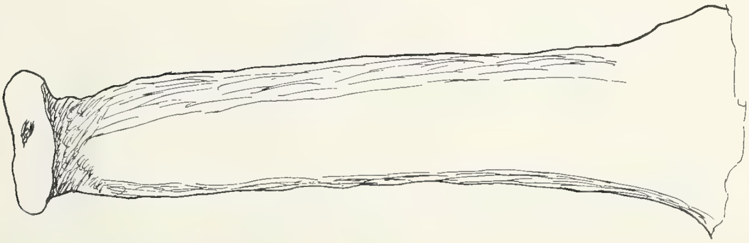

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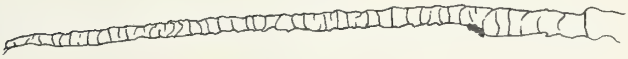

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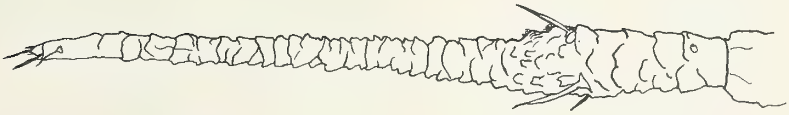

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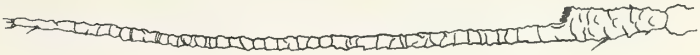

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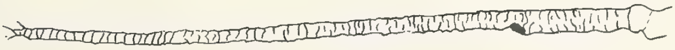

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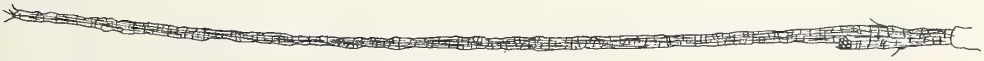


8

INTERCEPTIONS OF SPECIAL INTEREST AT U. S. PORTS OF ENTRY

(1959 records unless otherwise indicated)

A pupa of a NOCTUID (*Sesamia* sp.) in an ear of corn in baggage from Spain on September 5 at New York, New York; an adult of a WEEVIL (*Apion pomonae* F.) (a seed pest of vetch and lentils in several European countries) in vetch seeds contaminating straw jackets from France on June 18 at New York, New York; SNAILS (*Cochlicella barbara* (Linn.) and *Helicella pyramidata* (Draparnaud)) with package of mixed seeds in airplane baggage from Italy on September 23 at Detroit, Michigan; larvae of a FRUIT FLY (*Dacus* sp., possibly *vertebratus* Bezzi) in cucumber in ships stores from South Africa on November 10 at New York, New York; larvae of OLIVE FRUIT FLY (*Dacus oleae* Gmel.) 18 times, collectively, in olives in baggage and plane stores from Italy and Greece, at New York (New York) (17) and at Boston (Massachusetts) (1); larvae of LARGE WHITE BUTTERFLY (*Pieris brassicae* (L.)) in ships stores from France and Italy on September 14 and October 30 at New York, New York; larvae of CABBAGE MOTH (*Mamestra brassicae*(L.)) in ships stores from France, Germany and Italy at Savannah (Georgia) (1) and at New York (3); larvae of VINE MOTH (*Lobesia botrana* (Schiff.)) in baggage from Syria on August 28 at New York, New York; larvae and adults of a SWEETPOTATO WEEVIL (*Cylas formicarius* (F.)) in sweetpotato cargo from Japan (this is the first identified interception of this pest from that country) on February 16 at Honolulu, Hawaii; an adult of a BROAD NOSE WEEVIL (*Phyllobius* sp.) in wood moss packing material (recovery of specimen made by Berlese funneling process) for nursery stock cargo from France on April 23 at Hoboken, New Jersey; larvae of MEDITERRANEAN FRUIT FLY (*Ceratitis capitata* (Wied.)) 26 times, at Miami (Florida) (2) in ships stores from Portugal, at Philadelphia (Pennsylvania) (1) in ships stores from Brazil, and at New York (New York) (23) in fruits in baggage (22) (including 30 prickly pear fruits destined for Florida with 21 larvae) and airplane stores (1) from Mediterranean countries; and adults and larvae of KHAPRA BEETLE (*Trogoderma granarium* Everts) 7 times, at New York (New York) (1) in ships stores, at Houston (Texas) (1) in ships stores, at Charleston (South Carolina) (2) in Guar-Gum cargo from India, at Mobile (Alabama) (2) in ships stores, and at Seattle (Washington) in ships stores. (Plant Quarantine Division, December 31, 1959).

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES [1/]

1959

CEREAL AND FORAGE INSECTS

Small Grain Insects: Several species of APHIDS caused varying degrees of damage to several small grain crops over the Nation during 1959. Of these, GREENBUG (*Toxoptera graminum*), CORN LEAF APHID (*Rhopalosiphum maidis*) and ENGLISH GRAIN APHID (*Macrosiphum granarium*) were the most troublesome. Greenbug was the most important insect problem in Minnesota during 1959, the last major outbreak of this pest in that State having occurred in 1926. In Oklahoma, the heaviest widespread greenbug damage that was encountered during the past several years occurred during 1959 in that State, with controls being applied to an estimated one million acres. Heavy greenbug damage was also recorded in Wisconsin, Illinois, Missouri and Nebraska.

The 1959 outbreak of greenbug in Minnesota apparently resulted from aphids carried into the State by high southwesterly winds from infestations in Oklahoma, Kansas and adjacent states. The winds diminished in Minnesota and the aphids were dropped along a cold front, which was moving in a southeasterly direction, and extended from Nobles County in the south to Mille Lacs and Kanabec Counties in the north. The first and heaviest infestations occurred along this cold front; subsequent infestations probably taking place from later high winds which scattered the initial one. Earliest and heaviest populations occurred in Watonwan, Brown and Nicollet Counties which suffered the most crop loss. Control was poor.

Weather conditions were favorable to greenbug all the way in Minnesota, first by providing ideal invasion conditions; second, cool temperatures hindered predator increase and reduced effectiveness of insecticides; and third, high winds hindered good insecticide coverage. Oats was the crop most seriously injured. The outbreak in 1959 occurred in early May, almost a month earlier than previously recorded outbreaks in the State. Grain crops were in succulent conditions and greenbug populations developed quickly, many fields being a total loss within a few days after damage was first noted. There was a reluctance to spray because of the threat of reinfestation, and a virus disease further complicated the situation. This reluctance to control greenbug because of the threat of reinfestation and the presence of the disease may account for losses that could have been avoided. Generally, poor results were due primarily to spraying too late to effect any protection to the crop.

Large numbers of greenbug were trapped in Wisconsin during the period May 2-6, when strong southerly air currents were common. Heavy, localized feeding and "yellow-dwarf" injury in small grains were observed by June 5 in Green, Trempealeau and La Crosse Counties. Local infestations of greenbug and "yellow dwarf" were common over the State, with controls being applied to approximately 20,000 acres. "Yellow dwarf" was more prevalent in Wisconsin during 1959 than for nearly a decade.

Greenbug was more abundant and widespread in fields of wheat and oats in Illinois during 1959 than for many years, and it is doubtful if there was a field of oats in the State was not infested. Many fields of oats were completely killed in the seedling stage; one such field about three inches high averaged 176 greenbugs per plant. Most oats which survived aphid attack were severely infested with "yellow dwarf".

1/ Including all reporting states except Hawaii and Alaska, which were carried in CEIR 10(4):46 and CEIR 10(6):74, respectively.

Heavy greenbug damage to spring-seeded oats appeared in north central and northeastern counties of Missouri in mid-May. Populations increased steadily for several weeks throughout the northern half of the State. Counts ranged 100-5,000 per linear foot in oats, 50-1,000 in barley and 40-800 in late-planted wheat. During late May and early June, parasites, predators and disease depleted populations of greenbug; but oats in the northern half of the State were severely injured by barley "yellow dwarf," transmitted by this insect.

Following locally heavy infestations during November and December 1958, populations of Toxoptera graminum were light but widespread throughout Oklahoma in January 1959. By mid-February, populations of this pest were building up to damaging proportions in the eastern half of Tillman County and winged forms were becoming abundant by mid-March; populations were also building up in central and north central areas of the State. "Greenbug spots" were appearing in fields of small grain throughout north central Oklahoma by late March and damage continued in this section of the State and in the northeast panhandle area, to a lesser extent, until early May. This was the heaviest widespread damage encountered during the past several years in Oklahoma, with controls applied to an estimated one million acres. Infestations appeared again in late October in the southeastern-south central area and further surveys showed light populations of greenbug becoming increasingly common in southeast and central areas of the State by mid-December.

Greenbug infestations were relatively light in the panhandle and high plains area of Texas during 1959, with some economic damage being reported in the north central portion of that State. Greenbug was much lighter in Arkansas during 1959 than during 1958; but local damage by this pest to wheat, barley and oats was reported in Kansas, with controls being required in localized eastern areas of the State.

Greenbug populations were light on small grains in the east central area of Nebraska during May, causing little or no injury. However, moderate to heavy infestations in Lincoln County caused severe damage to oats and barley, which is the first record of losses since 1952. Greenbug first appeared in South Dakota in mid-May in the eastern edge of the State, with averages of 20 per leaf blade being found on spring wheat in localized areas. Cool weather favored the pest, which spread for about two weeks. Warm weather, with high lady beetle and damsel bug counts, brought greenbug populations down to non-economic numbers by the second week of June. Many fields of small grain were reported plowed under due to the effects of this pest. Scattered, trace infestations of greenbug occurred over a wide area of North Dakota; however, populations did not increase and no plant injury occurred.

Greenbug populations were light in New Mexico during early spring, but began to build up quite rapidly during March in fields of wheat in Quay, Curry, Roosevelt and Eddy Counties. In Curry County, counts were often more than 100 per linear foot of row in fields of wheat during April. Greenbug infestations in wheat and barley in Colorado were localized, with damage to wheat being negligible and losses to barley being due to a combination of this pest and the weather.

Greenbug injured oats in Worcester County, Maryland, during early November. Low numbers of this pest occurred on this same crop in Louisiana during 1959, while a serious infestation was found on seedling rice in Iberville Parish. This latter occurrence is believed to be a new host record for this species in the State.

CORN LEAF APHID (Rhopalosiphum maidis) caused heavy damage to small grain crops in areas of Texas, New Mexico, Arizona, Nevada, Washington and Montana. In Nevada, infestations were heavy on grain in Churchill, Lyon and Pershing Counties from May through July. In many fields, plants became yellow and damage was heavy. This pest was very common and abundant throughout western, southern and central sections of Montana and transmitted barley "yellow dwarf." In a few cases there was extreme damage. Corn leaf aphid was considerably less important in Wyoming during 1959 than in 1958, appearing late in the season and not building up to large populations.

Populations of this aphid were above average throughout the southern area of Idaho, particularly in eastern and southeastern portions where an extensive appearance of barley "yellow-dwarf" virus was noted.

Corn leaf aphid damaged spring barley in several counties of Utah; and the pest became heavy in barley in mid-February in Arizona, where it continued extremely heavy until harvest. Heavy honeydew deposits in Arizona resulted in abnormal awn extension and light heads. Most wheat in Arizona was relatively free of corn leaf aphid. In New Mexico, light to heavy infestations of this species damaged barley in Chaves, Dona Ana, Eddy and Sierra Counties. Controls were applied to most barley in northern Dona Ana County.

Corn leaf aphid caused considerable damage to small grains in north central, south central and southwest areas of Texas; and populations were common during the winter and spring throughout Oklahoma. In Delaware, a heavy infestation of this aphid occurred on a very young cereal cover crop in New Castle County during early October.

APPLE GRAIN APHID (*Rhopalosiphum fitchii*), ENGLISH GRAIN APHID (*Macrosiphum granarium*) and *M. dirhodum* were prevalent in the western area of Washington and loss to oats, barley and wheat from cereal "yellow dwarf" was estimated at one million dollars. Grain aphids were low and of little concern in the eastern area of the State. Apple grain aphid and corn leaf aphid infestations were heavy in fall-seeded barley in the dry-land wheat area of central Washington during November, especially in the western half of Adams County. Such a heavy infestation has not been seen before by workers in this area.

In some of the other western states, English grain aphid caused some damage to small grains. Some damage occurred to barley and other small grains in northwestern Wyoming. This aphid was rarely damaging during 1959 in Utah; and populations were generally low in grain in northern areas of Idaho, except for moderate infestations in Bonner County during July and some heavy infestations in the southwestern area of the State during the same period. In Oregon, English grain aphid was present in low numbers on grain throughout the major part of the season.

English grain aphid was light to medium on heads of wheat statewide in Arizona during April and early May; most barley was not infested. In New Mexico, populations of this grain pest were generally light to moderate in grain fields in Curry, Roosevelt, Lea, Eddy, Chaves and Dona Ana Counties. Populations of the pest were common during late winter and spring on small grains throughout Oklahoma and numbers were only noneconomic in Kansas.

Populations of English grain aphid in Minnesota were low in late May and early June and posed no problem during 1959, but numbers were very abundant and widespread in wheat in Illinois. Infestations were light in Missouri in early March and by mid-April populations of 0.5-25 per foot of row existed in the southeast area of the State.

English grain aphid was present in low numbers on oats in Louisiana during the 1959 season. In Delaware, this aphid was present on cereal crops in most areas by mid-April and abundant in Sussex County. The pest was also common on winter rye cover crops in Kent County in late November.

Several other species of aphids were reported as infesting or damaging some small grains to varying degrees. A ROOT APHID (*Tetraneura hirsuta*), which was found on rice at Belle Glade, Palm Beach County, Florida, during the period May 25-29, was the first United States record for this species. Apple grain aphid infestations were quite common in small grains throughout Oklahoma during late winter and spring and very light numbers began appearing again in central and south central area small grains by mid-October. In Kansas, apple grain aphid was present only in noneconomic numbers during 1959; and the species was light on grain during early summer in Curry, Roosevelt, Eddy, Chaves and Quay Counties, New Mexico.

A GRAIN APHID (Sipha agropyrella) was collected on winter and spring wheat on San Juan and Lopez Islands in Washington; a WHEAT APHID (Brachycolus tritici) was heavy and spotty in several fields of wheat in Curry and Roosevelt Counties, New Mexico, and unspecified species of aphids caused moderate to severe damage to oats in one location in Palmyra, Maine, during July.

CHINCH BUG (Blissus leucopterus)was generally lighter than usual during 1959 in the states affected by this pest. Fall surveys in Nebraska detected a smaller population than in past years, being generally noneconomic. Only light damage was observed. Chinch bug was present in central and eastern small grain fields in Kansas during April and May. In Missouri, only two southwest district counties were rated as severe as a result of the 1959 survey. Infestations were light in barley and wheat in this State in mid-May, counts ranging 0-5 per foot of row. Mating and egg laying began in late May, and no damage to small grain was evident.

Chinch bug numbers in Arkansas were found to be somewhat lighter in 1959 than in either of the previous two years and the pest should not be a problem in 1960. The 1959 chinch bug hibernation survey indicated continued reduction in potential populations for 1960 in Oklahoma, with only the northeast area and scattered localities in the central and north central areas of the State as potential "hot spots." Chinch bug was present in many grain fields in Illinois, but no serious damage was reported, while in Louisiana, large populations developed in Caddo and Bossier Parishes in the fall.

FALSE CHINCH BUG (Nysius ericae) populations in Utah were far below those of 1958; however, this pest was spottedly numerous on range and about grain fields. In New Mexico, moderately heavy infestations of various species of STINK BUGS damaged barley in Lea County, while infestations in wheat fields in Curry, Roosevelt, Quay and Harding Counties were much lighter; and heavy populations of unspecified stink bugs occurred on several crops, including barley, in Imperial County, California. A heavy infestation of SOUTHERN GREEN STINK BUG (Nezara viridula) was observed in barley in East Baton Rouge Parish, Louisiana.

TARNISHED PLANT BUG (Lygus lineolaris) adults and nymphs were generally common on buckwheat all season over Delaware. Several other species of PLANT BUGS, largely Stenotus binotatus, Leptopterna ferrugatus and Thyrillus pacificus, damaged grasses and small grains in scattered areas of Utah.

RICE STINK BUG (Oebalus pugnax) first appeared in Louisiana rice fields in early June on barnyardgrass, moving from this host to rice as the latter began to head. Populations varied from field to field, but highest counts were taken in fields located in areas treated for imported fire ant.

Rice stink bug numbers have increased in rice and small grains in Arkansas during the last few years. It has been considered a damaging pest by rice growers and control measures have been applied in several cases. An experiment was conducted during 1959 in an attempt to determine the level of infestation which constitutes a damaging infestation.

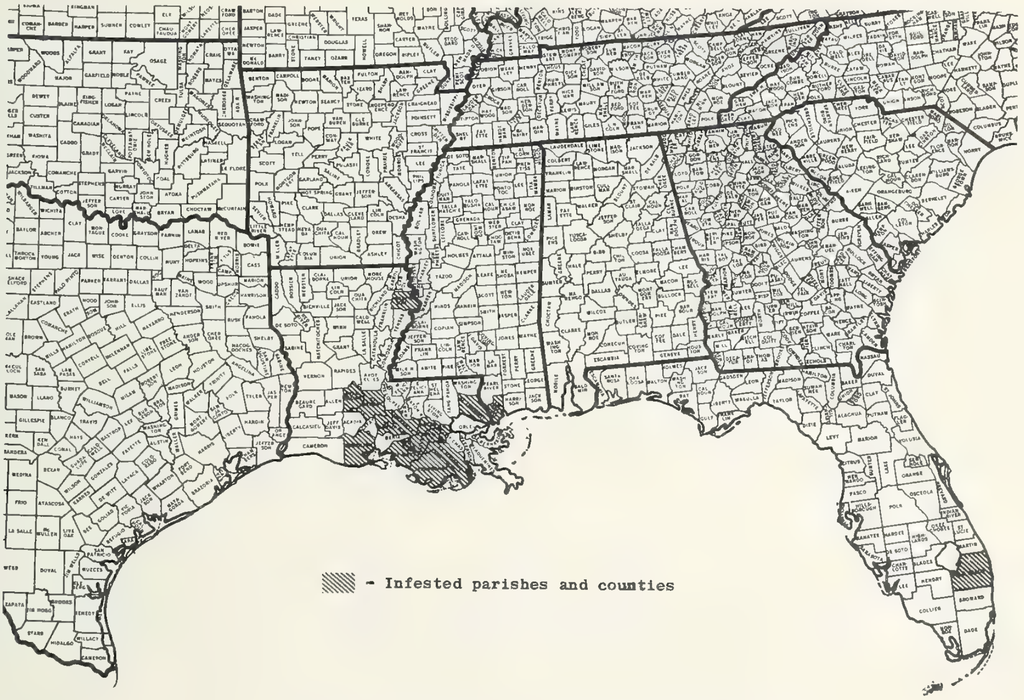
A table showing the various treatments which were replicated three times appears on page 225. Insects were caged on the rice in one square yard nylon cages.

Statistical analysis of the results on the table show that there was no significant reduction in either yield or quality with up to 80 rice stink bugs per square yard. Additional work along these lines may be conducted during 1960. Extensive work was also conducted throughout the growing season in Arkansas on occurrence, location, hosts and seasonal occurrence of rice stink bug. Occurrence of this pest in rice was found to be very closely associated with grass in rice fields, principally the barnyardgrasses (Echinochloa spp.).

Number and Stage of the Rice Stink Bug and Stage of
Infested Rice Used in an Arkansas Experiment

Treatment Number	Number of Stink Bugs	Stage of Stink Bugs	Stage of grain Development
1	0	-	-
2	20	Adults and nymphs	Milk and dough
3	40	Adults and nymphs	Milk and dough
4	80	Adults	Milk and dough
5	80	Nymphs	Milk and dough
6	80	Adults and nymphs	Milk
7	80	Adults and nymphs	Dough

RICE DELPHACID (*Sogata orizicola*), the vector of hoja blanca disease of rice, was first found on three properties in Palm Beach County, Florida, in 1957, and was found on two properties in Hancock County, Mississippi, during 1958. Eradication treatments have been applied in these two states. In 1959, rice delphacid was first found in Louisiana in St. Tammany Parish, and later in thirteen additional parishes. Surveys in Arkansas, California and Texas during 1959 were negative for this vector of hoja blanca disease. However, small numbers of *S. furcifera* were found in Arkansas. Hoja blanca disease has been found in all counties and parishes infested with *S. orizicola*, and in addition, has been found in Harrison County, Mississippi.



Distribution of *Sogata orizicola*

Migrations of SIX-SPOTTED LEAFHOPPER (Macrosteles fascifrons) into North Dakota occurred May 11 in southeastern counties. Counts were low in small grains until May 25 when a rather heavy migration occurred; counts of 2-5 per sweep were common in the southeast area. Leafhoppers had dispersed by June 13 and could be found in all areas. Counts averaged 0.1-1.0 per sweep, comparable to data for the same 1958 period. Numbers of six-spotted leafhopper in small grains continued to decline during June and did not increase appreciably for the remainder of the season. POTATO LEAFHOPPER (Empoasca fabae) was of importance on cereal crops in Virginia.

Several species of ARMYWORMS caused some economic damage in limited areas during 1959, but there were no major outbreaks in small grains. ARMYWORM (Pseudaletia unipuncta) heavily damaged small grains in Highland, Northampton, Princess Anne, Montgomery, King William, Caroline, Charlotte, Accomack and Brunswick Counties, Virginia; and spring populations were light in Maryland and light on grains throughout Delaware. Adult flights in Delaware occurred during mid-April and mid-August in Kent and New Castle Counties.

Armyworm was again not a threat to oats in Louisiana until the end of April, when numbers increased tremendously in some areas. Heavy infestations were noted in Acadia Parish and a field in Vermilion Parish was estimated to have been more than 50 percent destroyed. Infestations of this pest in small grain in Texas were not as heavy as in past years, but they did cause economic damage.

The annual survey in Arkansas showed the presence of some armyworm larvae at the usual time, but numbers were low and size variable. In Missouri, first armyworm moths of the season appeared March 30 in the southwest section, and moderate to heavy flights continued through April. Small larvae appeared in southeast area barley in early May and by midmonth rank fields of wheat and barley contained populations of 5-30 armyworm larvae per square foot. Most damage in Missouri occurred in the southeast and central sections of the State.

Armyworm was scarce in Illinois, although widespread in the State, and required very little control. In Indiana, moth numbers were moderate in late spring, but larval damage was very moderate. Abundance of grass at that time probably prevented development of an economic problem. Armyworm moth flights were light to moderate during June in eastern areas of North Dakota. Larvae were observed in most southeastern grain fields in the State the week of July 6. Generally, noneconomic numbers were present and no damage was noted in any area. Scattered, light armyworm infestations were observed in Minnesota, mainly in the west central and northwestern districts, but no serious problems developed. In Wisconsin, large numbers of armyworm moths were trapped the first half of June, but infestations did not develop except for a localized area in Kewaunee County.

FALL ARMYWORM (Laphygma frugiperda) caused some damage to oats in the fall in Louisiana and a total of 146 per 100 sweeps were collected on rice in June in Vermilion Parish. Larvae of WHEAT HEAD ARMYWORM (Faronta diffusa) averaged about 6 per 100 sweeps in wheat fields near Mosquero, Harding County, New Mexico, in June, while lighter infestations occurred in wheat fields in Curry and Roosevelt Counties. Wheat head armyworm was of slight economic importance in a few southern areas of Kansas.

Various species of CUTWORMS caused some losses to grains over the Nation, but most damage ranged light to moderate and was scattered. ARMY CUTWORM (Chorizagrotis auxiliaris) caused economic damage to small grain in Texas, although infestations were not as heavy as in past years. Damage to small grains by army cutworm in Kansas remained low again in 1959; and populations of the pest in Nebraska were light to moderate generally, with the first light trap collections occurring April 4 at North Platte. Heaviest moth flights in the western half of Nebraska occurred the first two weeks of June. There was some damage by army cutworm to barley and wheat in Keith and Scotts Bluff Counties, with highest counts averaging 6 larvae per square foot. Fall moth flights were light to moderate and somewhat late at North Platte, Nebraska.

Populations of army cutworm were low in South Dakota during 1959, with a very small amount of damage noted in the southwest area in winter wheat. Scattered infestations occurred in central and eastern areas of Montana, but numbers were generally down. Army cutworm damaged much less small grain acreage in Utah in the spring than normal, while infestations in Colorado were localized in wheat, with negligible damage in most areas. This species caused minor damage to cereals in Wyoming during 1959.

Infestations of BLACK CUTWORM (Agrotis ipsilon)* and VARIEGATED CUTWORM (Peridroma margaritosa) in small grain were not as heavy as in past years, although some economic damage was caused by both species. Populations of variegated cutworm were much reduced in Kansas from the high populations that were present in 1958, with very little damage during 1959. PALE WESTERN CUTWORM (Agrotis orthogonia) caused scattered damage in central area grain fields in Montana, with only a few fields needing reseeding. Moth flights in Nebraska were light and there were no losses, much the same as in 1958. This species was not significant in Kansas during 1959.

Larvae of unspecified species of CUTWORMS attacked small grains at scattered locations in Bottineau and Pierce Counties, North Dakota, with severe damage in infested fields. Counts of larvae averaged 4-5 per linear foot in some fields. An unknown species of cutworm severely damaged grasses and grain in the northeastern part of Montana, while various species were of importance on several cereal crops in Virginia.

BEET WEBWORM (Loxostege sticticalis) damaged some grain in Teton County, Montana, while moderate to severe infestations occurred over a wide area of North Dakota, causing injury to small grains. STALK BORER (Papaipema nebris) populations in Kansas were higher than usual during 1959, but damage to wheat and oats was heavy only in a few localized areas. Infestations of this pest on wheat in Minnesota were light in the south central and southeastern districts of that State.

WIREWORMS caused some damage to grain crops, mainly in western states, only one eastern state reporting any injury by this group of insects. GREAT BASIN WIREWORM (Ctenicera pruinina noxia) severely damaged grain crops in Sherman and Gilliam Counties, Oregon. The extent of injury was greater than observed for several years, with fields showing about 50 percent damage and 20 percent of plants destroyed. Also in Oregon, unspecified species of wireworms damaged spring-seeded barley and other grains in the Willamette Valley, an unusual occurrence in this area. In North Dakota, infestations of unspecified species of wireworms injuring small grains were reported from Griggs, Towner, Pierce and Cavalier Counties; crop damage being extensive in Pierce County. Infestations of Limonius spp. were light on wheat in South Dakota and actual damage was very slight. Damage to grain crops throughout Idaho by numerous species of wireworms appeared to be generally above average for 1959. Undetermined wireworm species were very common in central area wheat fields in Montana early in the season, but most fields grew rapidly and damage was not acute. In Maine, during July, undetermined species of these pests caused moderate to severe damage to oats in one Palmyra location.

Larvae of FALSE WIREWORMS (Eleodes spp.) averaged 1-4 per linear foot of row in winter wheat in west central and central areas of South Dakota, damage in most instances being only slight.

SOUTHERN CORN ROOTWORM (Diabrotica undecimpunctata howardi) adults were common on buckwheat in Delaware throughout the season, generally. WHITE GRUBS (Cyclocephala spp., Phyllophaga spp. and Anomala spp.) infested prepared wheat seed beds in the central area of Kansas, with areas of infestation being quite spotty.

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* Zimmerman, E. C., 1958. Insects of Hawaii, Vol. 7:253.

RICE WATER WEEVIL (Lissorhoptrus oryzophilus) was discovered in Butte County, California, in a rice planting in the Briggs area. This is a first record for this species in that State. Subsequent inspections revealed this pest had become generally distributed in five rice-growing counties of California, but apparently very little damage occurred to the rice crops in these counties. In Louisiana, larvae of rice water weevil averaged 12 per 5 stools in rice fields examined in Acadia Parish and severely damaged a rice field in Madison Parish. Rice water weevil is the principal pest of rice in Arkansas. Infestations are quite general over that State each year; however, control by drainage of irrigation water, properly timed, is universally practiced and damage is prevented. Soil insecticides and seed treatments are being adopted in some cases.

Specimens of a WHITE-FRINGED BEETLE (Graphognathus peregrinus) were found in a field of rice in Lafayette Parish, Louisiana, and established a new parish record for this group of pests (Graphognathus spp.).

A BEETLE (Colaspis sp.) has become a pest of rice in Arkansas. Overwintered larvae feed on the roots of seedling rice in the spring. Localized fields in Arkansas have been damaged in a few cases by stand reduction caused by larvae of this beetle. Changes in rotation, to avoid rice following lespedeza, have prevented infestations in most cases. Soil and seed treatments are being used in Arkansas in a few cases.

HESSIAN FLY (Phytophaga destructor) has shown a gradual decrease in several states during past years; but during 1959 populations of this pest showed increases in portions of Indiana, Illinois, Kansas, Missouri and Nebraska. Infestations in Indiana have been low for several years, but are now on the increase in the eastern portion of the State. Farmers in the Delaware and Randolph County areas had some economic loss and experimental plots showed losses as high as 8-10 bushels of wheat per acre. Fall infestations in the same area were significant.

Hessian fly populations in Illinois made a remarkable increase in 1959 after showing a gradual decrease during the last few years. The State average for percent of tillers infested was 7.2 in 1959 compared with 2.4 in 1958. The highest infestation in 1959 was in Sangamon County, with an average of 22.4 percent of tillers infested. Survey in some early wheat sown before the fall fly-free date showed 19-90 percent of plants infested with 20-525 forms per 100 plants.

Before wheat harvest in Missouri, considerable damage from hessian fly was observed in northwest, north central and west central districts of the State. The 1959 survey showed an increase in percent infestation in all districts. Observations in early fall-seeded wheat in central and west central areas of Missouri in late November indicated a high fall population of this pest. Counts ranged 30-92 percent of plants infested with 10-475 maggots and pupae per 100 plants. The State infestation average was 9.1 percent, compared with 2.6 percent for 1958.

Hessian fly populations were generally at noneconomic levels in Kansas; however, the summer survey in this State showed a higher average percent infestation of this pest than in 1958, especially in the northwestern area. Infestations were lower in the southeastern area. General fall emergence of adult hessian flies was delayed by a hot, dry midsummer and a light to heavy egg deposition occurred over Kansas after the normal fly-free date.

Hessian fly surveys during mid-April in Nebraska revealed numerous flax-seeds in volunteer wheat in southern counties. Fall-seeded and volunteer wheat in central and southeastern counties also contained flax-seeds at this time, with lodging evident in 20-30 percent of the wheat. Infestations were much heavier in Nebraska during 1958 and 1959 than during the past several years. Parasitism was as high as 100 percent in some areas in fall sampling of wheat stubble.

Hessian fly infestations in wheat were localized in Colorado and damage was negligible. In Oregon, numbers of this pest of wheat were low in the western area of the State during 1959, with no appreciable damage being observed. Wheat planted prior to the fly-free date in North Carolina had over 40 percent of the plants infested with hessian fly. Flax-seeds averaged 2-4 per plant in Rowan County in mid-January, and by early May less than 5 percent of the stalks in the same area were infested.

Several other dipteron pests caused some damage and concern. Infestations of WHEAT STEM MAGGOT (Meromyza americana), ranging 5-10 percent of stems, occurred in southeastern North Dakota wheat fields. This degree of infestation was above normal. Infestations of a WESTERN WHEAT STEM MAGGOT (Hylemya cerealis) in Colorado were localized and damage was negligible in most areas of occurrence. WHEAT JOINTWORM (Harmolita tritici) populations in Illinois were similar to those found in 1958. The heavier infested counties, with percent of tillers infested, were: Jefferson, 24.8; Jackson, 15.2; and Lawrence, 13.0. Also in Illinois, FUNGUS GNATS (Sciara spp.) were extremely abundant in wheat fields early in the season and caused much concern to farmers who thought they were hessian flies. A RICE LEAF MINER (Hydrellia griseola) was present in rice-growing areas of Sacramento, Yuba and Glenn Counties, California, but no controls were required.

SAWFLIES in wheat were not of too much concern during 1959. The 1959 survey for WHEAT STEM SAWFLY (Cephus cinctus) in North Dakota, conducted in eight northwestern counties of that State, showed an infestation range of 0-60 percent and an average of 10 percent. Infestation in 1959 was two percent lower than that in 1958 and the areas of heaviest infestation continued much the same as in previous years. Wheat stem sawfly was generally normal in abundance in Montana but damage occurred in Ravalli County fields, not normally subject to damage.

The area of approximately 40,000 acres in the Cuyama Valley of California, known infested by a WHEAT SAWFLY (Pachynematus sporax), received the fourth season spray treatment in the spring of 1959. Intensive survey failed to reveal any live sawflies during 1958 and 1959 in this location of Santa Barbara, Ventura and San Luis Obispo Counties. A survey late in the spring in Modoc and Plumas Counties revealed the presence of this sawfly in the area. As positive determination of this species is based on the adult male, and only larvae were obtainable from a suspected infestation that occurred in the Antelope Valley area of Los Angeles County, California, this season, an adult survey will be necessary in the early spring of 1960 to establish the species identity. As a result of positive findings in Modoc and Plumas Counties, and possible occurrence in Los Angeles County, this eradication program will be reevaluated in 1960. A SAWFLY (Pachynematus sp.) was present in wheat in Kansas, but numbers were not economic.

Several species of MITES were reported as damaging some small grains in a few areas of the country. WHEAT CURL MITE (Aceria tulipae), the vector of wheat streak mosaic, occurred in enormous numbers in Kansas, causing an estimated 80,000,000-dollar loss to the wheat crop in that State. In Wyoming, wheat streak mosaic was severe in some southeastern fields and moderate in others. Wheat curl mite was present in large numbers in certain areas in the fall of 1958. Losses were estimated as high as 50 percent in some fields in 1959. Infestations of wheat curl mite in wheat were localized in Colorado, with negligible damage in most areas. Infestations of this mite in barley in the same State were also localized, losses being due to a combination of infestation and weather. A 50-acre field of winter wheat in Whitman County, Washington, was severely damaged by wheat streak mosaic and plowed under. Although the disease and wheat curl mite had been previously reported from the State, this is the first record of economic damage.

Heavy numbers of BROWN WHEAT MITE (Petrobia latens) occurred early in the season in Klamath County, Oregon, but by mid-July the species was not a problem except for numerous overwintering eggs left in the soil as a potential threat for 1960. This mite was less damaging during 1959 in Utah than normal, particularly following spring rains. Damage was moderate in Juab, Tooele, Salt Lake and San Juan Counties. In Colorado, brown wheat mite infestations in wheat were localized, with damage in most areas being negligible; while in Kansas, the mite was economically important only in localized southwestern areas of the State. Brown wheat mite damaged several barley fields near Artesia, Eddy County, New Mexico; and the pest occurred only in isolated areas in Texas.

Damaging numbers of DATE MITE (Oligonychus pratensis) were present in many fields of wheat in the western half of Kansas; and light infestations of the same pest damaged barley at Ft. Sumner, De Baca County, New Mexico. WINTER GRAIN MITE (Penthaleus major) populations ranged light to heavy in south and north central sections of Texas, especially in fields planted to small grains for several years.

Highest populations of a BARLEY THRIPS (Limothrips denticornis) in four years occurred over a wide area of North Dakota, with an estimated 7,000 acres of barley being treated. Economic infestations of this thrips, two adults per stem prior to heading, were common. GRASS THRIPS (Anaphothrips obscurus) also was very abundant in many wheat fields in Illinois and apparently caused some damage. Survey of seven fields in the east-southeast section of the State, May 12, showed two fields (28.6 percent) heavily infested.

Adults of an undetermined species of STONEFLY caused light damage to wheat near Cut Bank, Glacier County, Montana, by feeding on stems. In California, a TADPOLE SHRIMP (Apus oryziphagus) caused about the same damage as normal in rice-growing areas of the State, in association with hydrophilids.

Sugarcane Insects: Egg masses of SUGARCANE BORER (Diatraea saccharalis) were first observed on cane in Louisiana in mid-April, averaging 9 masses per acre. These increased to 30 per acre by April 24 and then dropped to 6 per acre by April 30. By the third week of May egg masses had disappeared. Fresh sugarcane borer feeding signs were evident on about one percent of the plants examined in mid-April, and increased to 7 percent by May 1. Deadhearts were first observed in the State the third week of May and their numbers increased steadily thereafter. Deadhearts were most numerous in the southwestern area of the sugarcane belt, averaging 1,133 per acre. Newly hatched larvae of the second generation of sugarcane borer appeared about mid-June and by July 10 were present in all stages of development.

During the week of July 10 an infestation of RUSTY PLUM APHID (Hysteroneura setariae) occurred on sugarcane in Iberia Parish, Louisiana. FALL ARMYWORM (Laphygma frugiperda) caused considerable damage to late summer-planted sugarcane in St. James and St. Martin Parishes of the same State.

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